

**6th INTERNATIONAL ECOLOGICAL FORUM
BALTIC SEA DAY**

St.-Petersburg, *March 21-24, 2005*

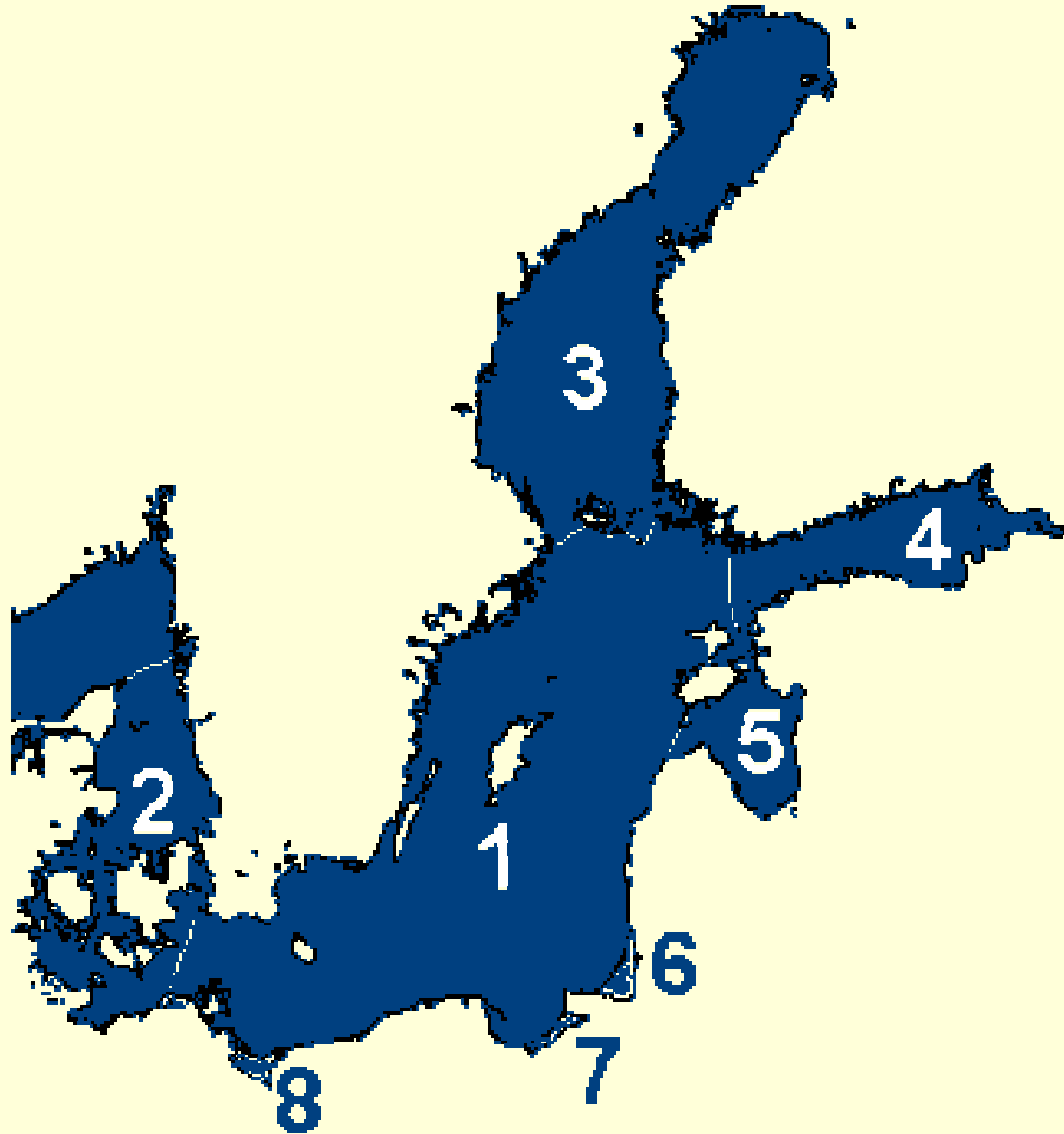
**Conception of Baltic Sea
Biodiversity**

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- **Baltic Sea is semi-closed, shallow, brackish water body having stepless salinity gradient and unique fauna and flora.**
- **It is a young sea and in glacial time it was a lake. Baltic Sea until now retains many features of lake.**
- **Biodiversity of Baltic Sea is relatively low while in its own way is unique and needs special measures for its preservation.**

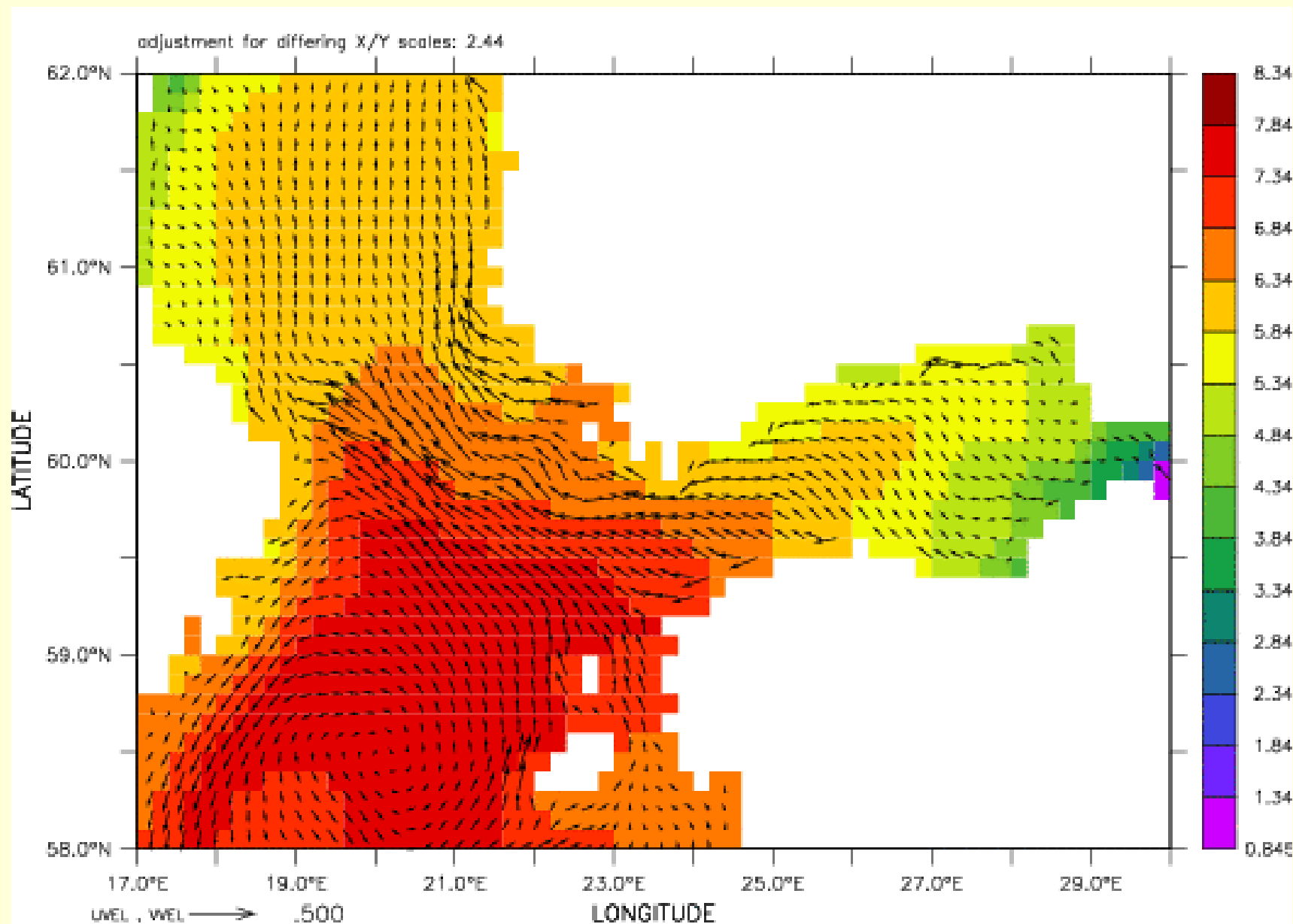
Sub-regions of Baltic Sea

1. Baltic proper
2. Kattegat and Belt Sea
3. Gulf of Bothnia
4. Gulf of Finland
5. Gulf of Riga
6. Curonian lagoon
7. Vistula lagoon
8. Oder/Odra lagoon



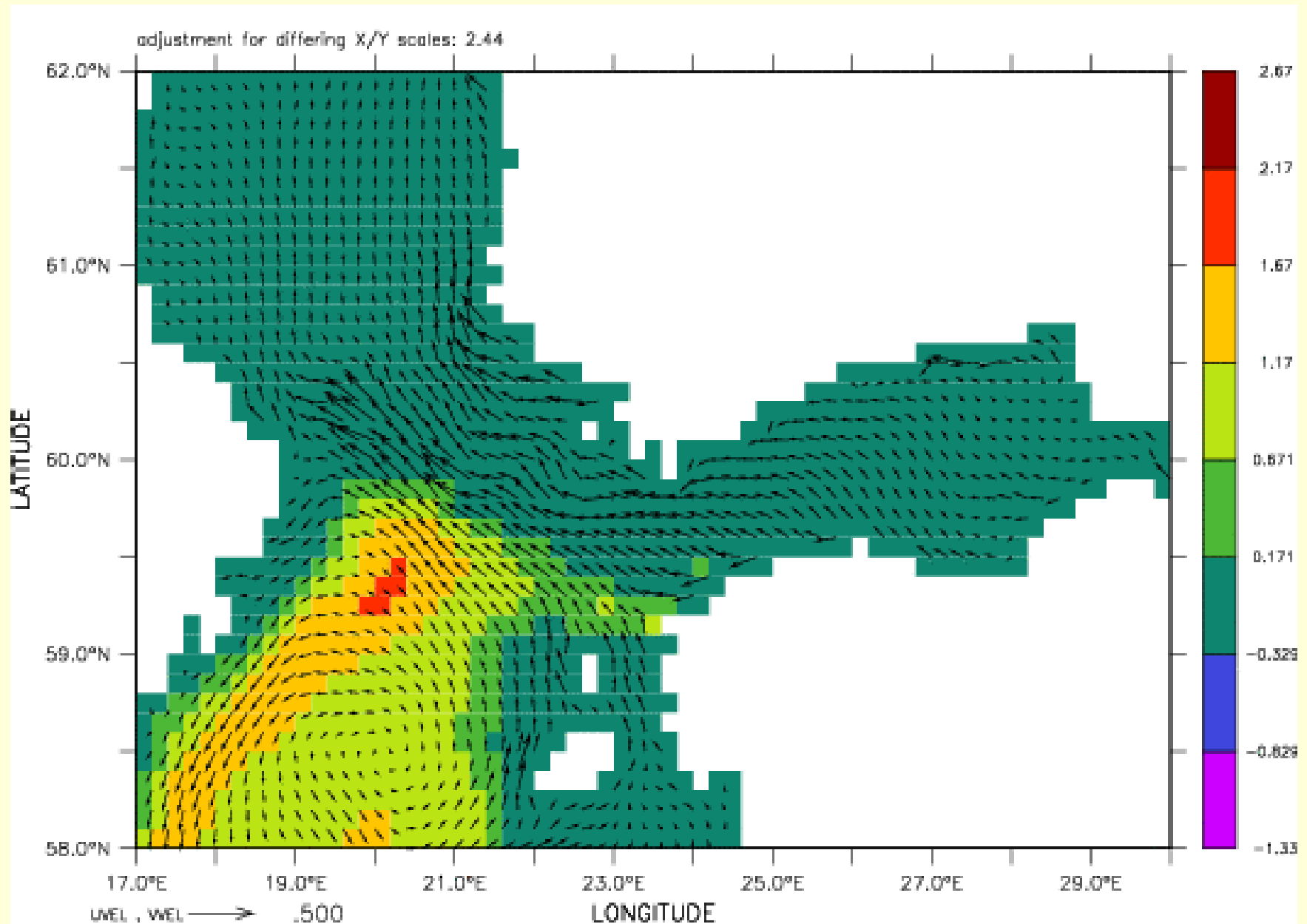
- **In the Baltic Sea there are oligohaline and mesohaline water areas, and everyone of them has its own specific flora and fauna.**
- **The most freshened there are Gulf of Finland and Gulf of Bothnia.**
- **Central water area of Baltic Sea has pronounced mesohaline character.**
- **Only in the western Danish straits polyhaline conditions can be found.**

Salinities and currents, 17.03.2005

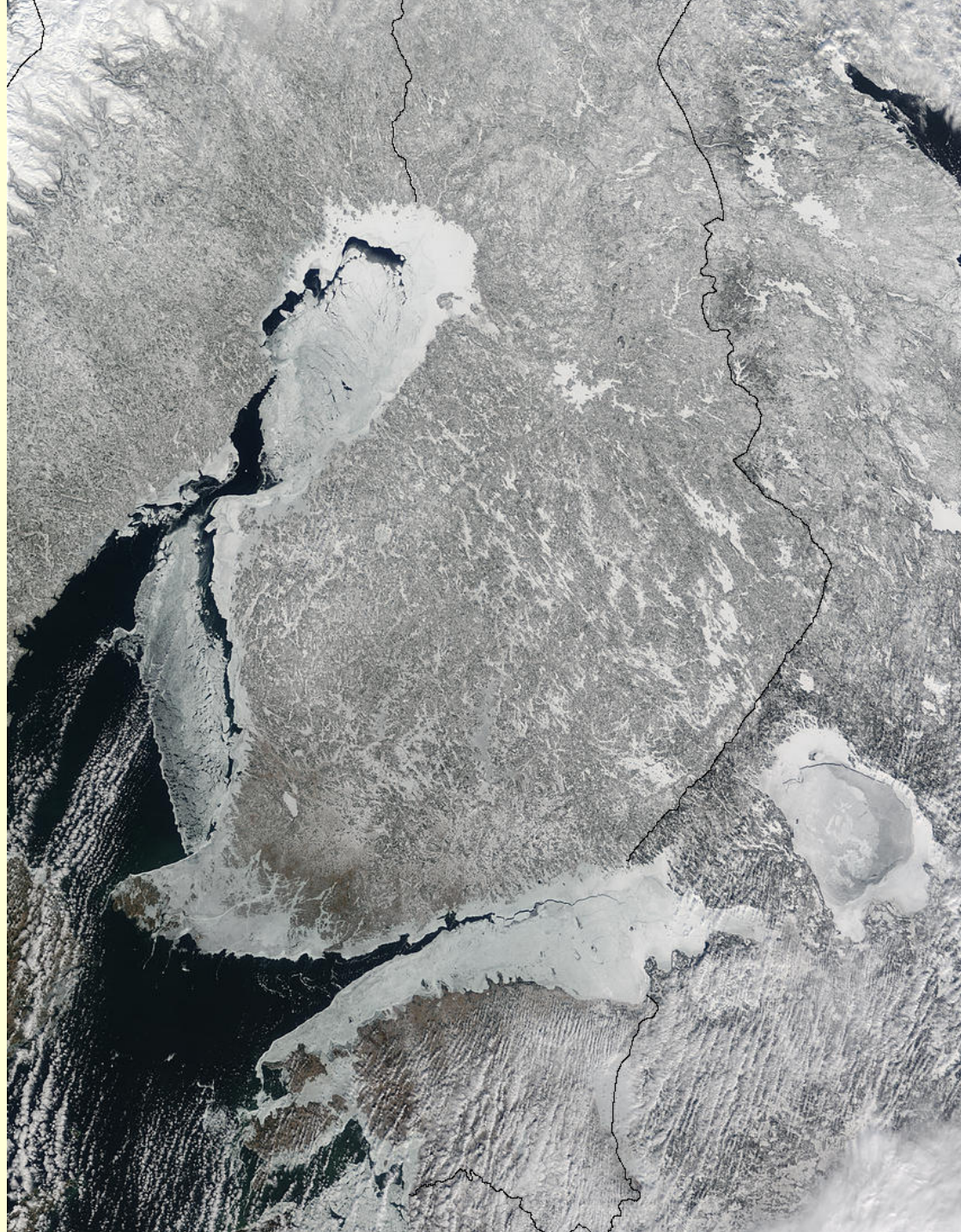


- **Baltic Sea also is uneven by its thermal conditions.**
- **Northern water areas are characterized by severe ice regime in winter time and are weakly warmed up in summer.**
- **Contrary to this along the southern shore of Baltic Sea ice is formed in winter very seldom, in summer surface water is well warmed up.**
- **Now in summer time due to the global warming the contrast between the northern water areas and the southern part is rising.**

Temperatures and currents, 17.03.2005



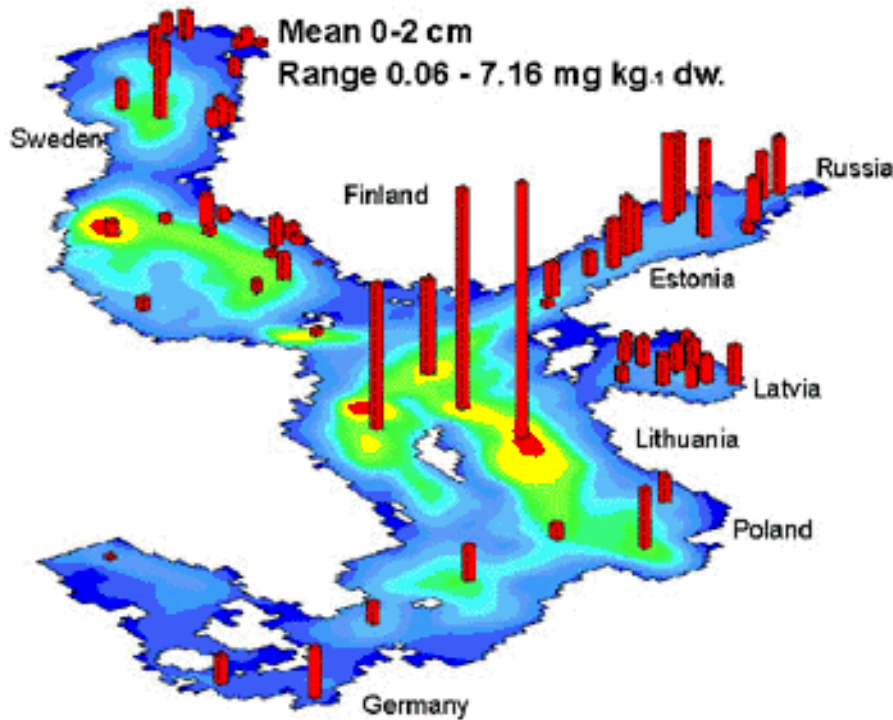
Now, because of global warming, the ice cover is observed only in Gulf of Bothnia and Gulf of Finland



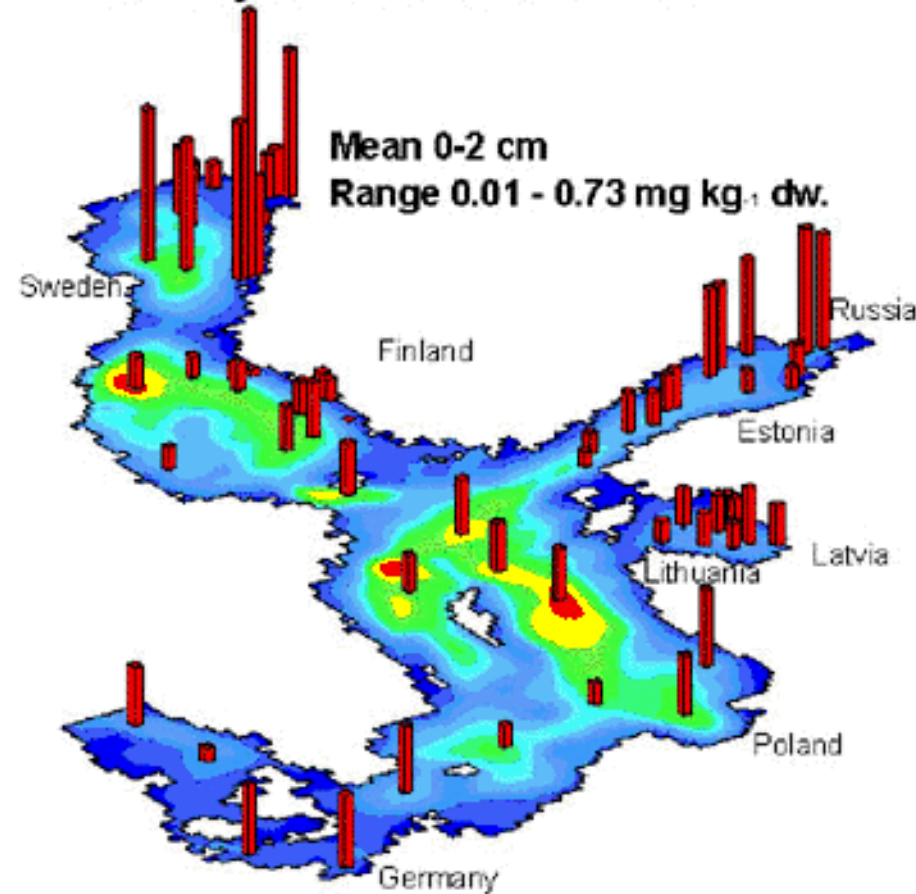
- **Flora and fauna of Baltic Sea are submitted to significant anthropogenic charge.**
- **Since Baltic Sea has different salinity and thermal conditions in different water areas, pollutants behave differently in different parts of the sea.**
- **The situation is also aggravated by labored water exchange with the ocean and due to this dangerous substances are accumulated fast, and this intensifies negative impact on flora and fauna.**

Accumulation of cadmium and mercury in bottom sediments of Baltic Sea

Cadmium in sediments of the Baltic Sea

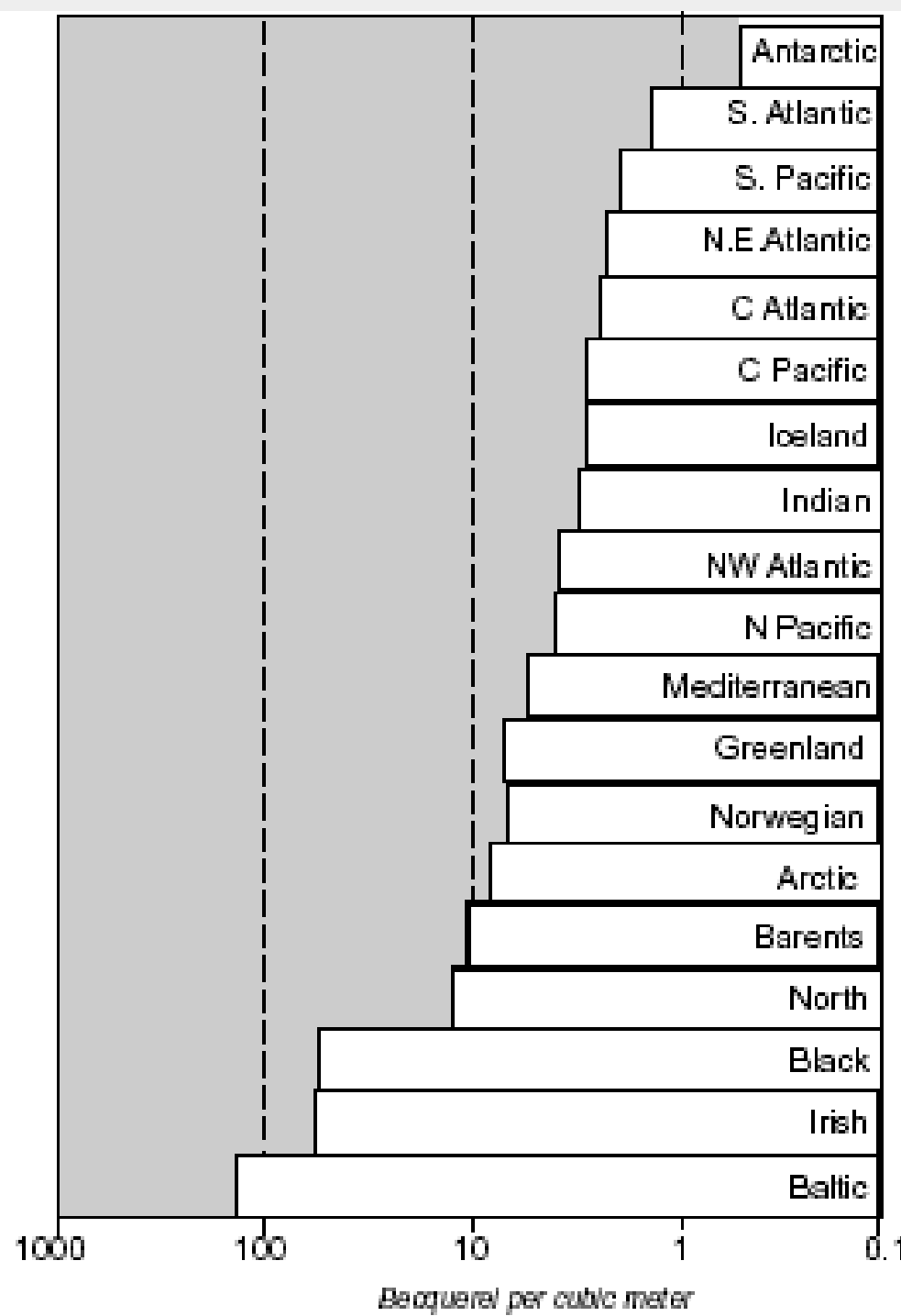


Mercury in sediments of the Baltic Sea



- **It is to notice that during last 30 years states of Baltic Sea region succeeded to decrease income of heavy metals.**
- **However until now concentration of them and other toxicants in the sea inhabitants, including fishes, remains by many times higher than in the Northern Atlantic.**
- **Level of anthropogenic pollution by radionuclides in Baltic Sea is also higher than in other water bodies of the world. In comparison with North-West Atlantic and North Sea it is higher by 40 and 10 times respectively.**
- **It is consequence of nuclear tests in atmosphere in 1960s and Chernobyl's catastrophe in 1986.**

Average
concentration of
 Cs^{137} in surface
waters.
Logarithmic scale.
1990.



•Biodiversity of Baltic Sea is studied intensively since the middle of 19th century. Studies of Swedish zoologist Loven (1864) could be considered as pioneer. It is to mention works of Möbius (1873) and Heinke (Möbius, Heinke, 1883), and also by Brandt (1897) and Nordquist (1890).

•In the beginning of 20th century the number of works on the Baltic Sea biodiversity has increased. There were publications by Ekman (1913), Petersen (1913, 1914) and Thulin (1922). Later there were studies by Demel with co-authors (Demel et al., 1927-1954), by Remane (1933-1955), by Segersträle (1932-1958) and by Välikangas (1926-1933), by Kinne (1949-1970) and others.

Russian and soviet scientists also contributed to the studies of Baltic Sea biodiversity.

We shall notice only some of them and years of their major scientific publications:

- Derjugin(1923-1924, 1934-1935)**
- Nikolaev(1949-1985)**
- Shurin(1957)**
- Zenkevich(1963)**
- Khlebovich(1974)**
- Jarvekulg(1960-1999)**
- and many others**

Above-mentioned scientists from Baltic Sea states have demonstrated earnestly that biodiversity of this young sea was formed in postglacial time and is highly heterogeneous by its composition.

It consists of three main components:

1) marine

2) freshwater

3) brackishwater (sensu stricta).

The first group is the cardinal part of Baltic Sea biota. It includes relicts of previous geological times and immigrants from remote marine water bodies.

The second group includes large number of Baltic Sea inhabitants, which come together with freshwater inflow.

The third group is represented by large number of species and in its turn is divided into 2 subgroups:

1) Ancient brackishwater arctic relicts (pseudorelicts-immigrants) formed in the glacial time in freshened areas of arctic basin and migrated into Baltic Sea in postglacial time from the North-East and East possibly via fresh waters.

2) Brackishwater forms originated from freshwater ones.

In 21st century studies of Baltic Sea biodiversity are continued successfully.

Studies of biodiversity on ecosystem and specific levels are continued.

Studies on molecular-genetic level were begun.

These studies allow describing biodiversity of this unique sea. It is possible to put a question about preservation not only concrete species but subspecies, local populations and even families of plants and animals being menaced by extinction in one or other water area of Baltic Sea.

Importance of molecular-genetic approach in studies of biodiversity will be discussed soon at special scientific meeting:

INTERNATIONAL WORKSHOP

**Exploring diversity of Baltic Sea biota:
new tools, results and implications**

22-24 April 2005

The workshop “Exploring diversity of Baltic Sea biota: new tools, results and implications” will be held in Tvärminne Zoological Station, University of Helsinki, on April 22-24, 2005.

The focus of the workshop is on the application of new tools of molecular systematics in studies of the Baltic Sea biodiversity and ecology.

•In November 2004 in Zoological Institute of RAS under aegis of HELCOM-BSRP project Lead Laboratory of Baltic Sea biodiversity was organized.

•The aim of this laboratory is not only studies of preservation of biodiversity, but also assistance to all states participating Baltic Sea Regional Project (Poland, Lithuania, Latvia, Estonia and Russia).

Lead Laboratory of Baltic Sea biodiversity started to work in Zoological Institute RAS November 1, 2004. At the end of December 2004 also was signed agreement on co-operation between ZIN RAS and HELCOM-BSRP.



After consultations with administration of Zoological institute a special web-page was created:

<http://www.zin.ru/projects/baltdiv/index.html>

On the next slide you can see information from this web-page.

BALTIC SEA REGIONAL PROJECT LEAD LABORATORY ON BIODIVERSITY

Decision on establishment of the Lead Laboratory on Biodiversity at the Zoological Institute has been made at the First Meeting of the **Baltic Sea Steering Group (BSSG)** <http://www.helcom.fi/dps.html> on 10 May 2004.

Duration of the project: 2004-2006.

Local Project Manager – Prof. N.V.Aladin (e-mail: aral@zin.ru).

Within the **BALTIC SEA REGIONAL PROJECT** (www.ices.dk/projects/balticsea.asp), a Lead Laboratories has been nominated for specific disciplines within each Large Marine Ecosystem module (Productivity, Pollution and Ecosystem Health, Fish and Fisheries, and Socio-economics) for both coastal and open sea activities. The aim is to develop a practical integration of institutes, to harmonize sampling techniques, to rationalize assessment and reporting and to achieve a general upgrading and use of equipment and laboratories in a cost effective and quality-assured manner. The role of the Lead Laboratories is the coordination of activities within their respective field of specialty. The Lead Laboratories are serving as links to the Coordination Centers, organize workshops and QA procedures, take the responsibility of harmonizing monitoring programs and serve as support for participating institutes during sampling and laboratory work and the handling and storing of data in databases.

The Scope of Services for the Lead Laboratory on Biodiversity and its Local Project Manager includes:

1. Serve as the Local Project Manager(LPM) and responsible officer of the Lead laboratory (LL), supervise and coordinate implementation of project activities relative to biodiversity issues under Component 1 (C1).
2. To organize an introductory coordination and a technical workshop on biodiversity issues.
3. To report results and progress according to the project plan to the Coordination Centers (CC).
4. To act as reference center within biodiversity towards other BSRP laboratories, HELCOM and ICES.
5. To work with all local facilities and coordinate on technical matters.
6. To assist the CC.s and LL:s when purchasing the necessary equipment to upgrade national laboratories.
7. To organize and train staff as required for new equipment and techniques.
8. To coordinate collection and distribution of data and samples within biodiversity issues and to assist the Coordination Centers in compilations and data processing.
9. To consult with the C1C/C1AC and/or the CC:s on technical matters.
10. To support further development of biodiversity monitoring and assessment of biodiversity loss in the Baltic Sea.
11. To support elaboration of biodiversity and nature conservation indicators and Ecological Quality Objectives for the Baltic Sea.
12. To support production and updating of threatened species and biotopes inventories in the Baltic Sea area.
13. To support protection of species/habitat/biotope diversity in the Baltic sea and its coastal areas.
14. To integrate and cooperate with other activities within Components 1, 2, and 3, according to arrangements made by the Coordination Centers.
15. To establish cooperation with relevant regional projects and organizations.
16. To coordinate compilations, data processing and assessments.
17. To participate in appropriate ICES working groups and regional fora.
18. To assist in the preparation for organized integrated evaluations and assessments and report results to ICES and HELCOM Working Groups/Committees and other relevant bodies.
19. Coordinate and establish links for ecosystem-based management between relevant marine (C1) and land based- coastal zone management (C2) activities.
20. Contribute to preparation of annual work plans according the PIP/PPP.
21. Liaise with national authorities and stakeholders to secure project support and sustainability

On the next slides there is provisional work plan of Lead Laboratory on Baltic Sea biodiversity

December 16-17, 2004 in Tallinn this provisional work plan were discussed during BSPR Component 1 & 2 Networking Meeting.

Work plan of LL on biodiversity for the period November 1, 2004 – October 31, 2005

1. To start to serve as the Local Project Manager (LPM) and responsible officer of the Lead laboratory (LL), supervise and coordinate implementation of project activities relative to biodiversity issues under Component 1 (C1). To find number of candidates for two positions of consultants.
2. To start to organize an introductory coordination and a technical workshop on biodiversity issues. To make consultation with scientists who are studying biodiversity of the Baltic Sea and to find candidates for forthcoming technical workshops on biodiversity issues to be held in Zoological Institute of Russian Academy of Sciences in St.Petersburg. To make a list of scientists from all the Baltic littoral states who are currently studying Baltic Sea biodiversity.
3. To start to report results and progress according to the project plan to the Coordination Centers (CC). To assist in making co-operative agreement with Zoological Institute of RAS. To assist in elaboration of laboratory budget.
4. To start to act as reference center within biodiversity towards other BSRP laboratories, HELCOM and ICES. To start to make data bases on free-living invertebrates from the Baltic Sea.
5. To start to work with all local facilities and coordinate on technical matters. To establish tight scientific contacts with biodiversity specialists from St.Petersburg State University, from GOSNIORH (local fisheries institute), from Baltic Sea Biological Station “Rybachiy”, from Kaliningrad State University and from other biological and natural history institutions of the Kaliningrad region.

6. To start to assist the CC.s and LL:s when purchasing the necessary equipment to upgrade national laboratories. To start to make a list of scientific and office equipment to be provided to national laboratories in accordance with approved budget.
7. To start to organize and train staff as required for new equipment and techniques. To find candidates for forthcoming trainings.
8. To start to coordinate collection and distribution of data and samples within biodiversity issues and to assist the Coordination Centers in compilations and data processing. To establish a data base on all field research stations around Baltic Sea.
9. To start to consult with the C1C/C1AC and/or the CC:s on technical matters. To discuss re-equipment of Baltic Sea Biological Station "Rybachiy" and to make a plan of hydrobiological studies rehabilitation under umbrella of this biological station.
10. To start to support further development of biodiversity monitoring and assessment of biodiversity loss in the Baltic Sea. To establish tight contacts with all Baltic Sea littoral state institutions that are responsible for monitoring process for this sea. To start to make a list of "hot spots" with high biodiversity loss in the Baltic Sea.
11. To start to support elaboration of biodiversity and nature conservation indicators and Ecological Quality Objectives for the Baltic Sea. To start to make a list of biological reserves, national parks, etc. for the Baltic Sea region. To start to make a list of key indicator species for the Baltic Sea.
12. To start to support production and updating of threatened species and biotopes inventories in the Baltic Sea area. To start to prepare brochure in which in popular form will be shown threatened species and biotopes at risk.
13. To start to support protection of species/habitat/biotope diversity in the Baltic Sea and its coastal areas. To start to establish tight contacts with scientists and authorities from already established biological reserves, national parks, etc. around Baltic Sea.

14. To start to integrate and cooperate with other activities within Components 1, 2, and 3, according to arrangements made by the Coordination Centers. To start to prepare first draft of Baltic Sea Biodiversity Report that should be written together with other our project participants.
15. To start to establish cooperation with relevant regional projects and organizations. To make a list of them.
16. To start to coordinate compilations, data processing and assessments. To start to create identical principals for data management within our project.
17. To start to participate in appropriate ICES working groups and regional forums. To start to make a list of forthcoming events that could be of interest for Baltic Sea biodiversity specialists.
18. To start to assist in the preparation for organized integrated evaluations and assessments and report results to ICES and HELCOM Working Groups/Committees and other relevant bodies. To establish tight contacts with official representatives of Russian Ministry of Natural Resources responsible for Baltic Sea projects: Mr. Sapronov V.D. and Mr. Korovin L.K.
19. To start to coordinate and establish links for ecosystem-based management between relevant marine (C1) and land based- coastal zone management (C2) activities. To start to discuss with scientists involved in our project necessity of establishing a special coordination team that will study and control possible global warming influence on the Baltic Sea biodiversity.
20. To start to contribute to preparation of annual work plans according the PIP/PPP.
21. To start to liaise with national authorities and stakeholders to secure project support and sustainability. To start to make a list of recommendations that might could help national authorities and stakeholders to perform environmental friendly policy in the Baltic Sea region.

In April 2005 after approval by authorities of HELCOM-BSRP the final plan must be confirmed. Its main items must be following aims and tasks:

- 1. Election of assistant-consultant on Data Management. Three candidates are selected for contest.**
- 2. Election of assistant-consultant on Hydrobiology. Three candidates are selected for contest.**
- 3. Making a list of leading scientists in systematics working on Baltic Sea.**

- 4. Making a list of scientific institutions, keeping collections on Baltic Sea.**
- 5. Modern revision of existing conceptions of Baltic Sea biodiversity.**
- 6. Creation of modern synthetic conception of Baltic Sea biodiversity.**
- 7. Holding in ZIN RAS a kick-up scientific conference given up to Baltic Sea biodiversity.**

8. Modern inventory of free-living invertebrates of Baltic Sea.

9. Creating data base on free-living invertebrates of Baltic Sea.

10. Preparation of new recommendations on conservation of Baltic Sea biodiversity.

All planned actions will be realized in co-operation with HELCOM-BSRP, ICES (The international Council for the Exploration of the Seas) и HELCOM-HABITAT, HELCOM-MONAS and other concerned institutions.

Also it is planned close co-operation with Ministry of Natural Resources of RF and analogous institutions of other Baltic states.